CHAPTER 13 - CONSTRUCTION DOCUMENTS

1.0 Formatting Requirements

1.1 Policies and procedures contained in this chapter apply to restricted and unrestricted capital improvement projects.

1.2 Any deviation from any of the requirements in this chapter shall either be negotiated during the fee negotiation phase or requested and approved by DFM prior to commencing the work.

1.3 The project architect/engineer shall provide drawings on vellum (or mylar) and shall provide electronic CAD drawings on CD (or DVD) in accordance with Chapter 17, Electronic Drawing Submittals.

2.0 Final Drawing Requirements

2.1 The preferred size of drawing sheets for final drawings is 24" x 36" although some projects may require a different sheet size.

2.2 Each sheet of the final drawings, including the cover sheet, will have a title block. The title block should be a minimum of 2” wide. The lower 12-inch section of the title block is reserved for the state’s project information as shown on the graphic sample provided at the end of this chapter.

2.3 All floor plans, including demolition, architectural, structural framing, mechanical and electrical plans shall be oriented the same direction, preferably oriented with a north arrow pointing to the top of the page, and shall have both a numeric scale and a graphic scale.

2.4 All building plans, i.e. architectural, reflected ceiling, roof, structural, mechanical, plumbing, electrical, lighting, fire suppression, of each floor shall be drawn to a scale of not less than one-eighth inch per foot. Floor plans of buildings less than 100 feet in length should be drawn at a scale of one-fourth inch per foot. Regardless of scale, all plans shall be the same scale, except for enlarged plans and details.

2.5 Each plan, detail and drawing shown on the documents shall be drawn accurately, and have the appropriate title and scale indicated.

2.6 The project architect/engineer shall efficiently use the drawing space on all drawing sheets leaving no white or blank spaces.

2.7 Each discipline shall provide a legend, using symbols and notations standard to the industry, indicating each symbol's meaning, and shall be located on the first sheet of each discipline’s individual set of plans.

2.8 Location and details of all fire-rated devices, dampers, assemblies, ceilings, walls, etc. to sufficiently explain fire-rating requirements shall be shown throughout the drawings. Each fire-rated assembly shall be identified by its Underwriters Laboratory (UL) design number or shall be an approved assembly by the IBC.

3.0 Final Specification Requirements

3.1 A current edition of a guide specification similar to Arcom’s MasterSpec. is required. All specifications shall follow MasterSpec section and numbering formats. Arcom’s website is www.masterpsec.com.

3.1.1 Beginning in July 2006, all unrestricted projects will require specifications to be written in the new 49 Division format.

3.1.2 Beginning in January 2007 all restricted projects will be required to have specifications written in the new 49 Division format.

3.2 Final specifications created by the project architect/engineer shall be original, except for the specification cover, Documents A through I, and Division One ("front end") which will be generated and provided by DFM Information for "front end" documents should be provided by the project architect/engineer on the Specifications Front End Data Form located on the DFM website.

3.3 At least one page in the specifications will have the project title, DFM project number, agency and each discipline's seal, signature and current date.

3.4 Final specifications shall be printed on only one side of 8 1/2" x 11" white bond paper with type size not less than 15 characters per inch.

3.5 Each page shall have a single column format with equal margins on both the right and left sides in order to facilitate two-sided copying.

3.6 Each page shall have the DFM project identification number printed above each page number~~s~~ with both numbers centered at the bottom.

3.7 Final specifications shall not be stapled or hole-punched.

3.8 Soils reports may be incorporated into the specifications at the end of the earthwork division.

3.9 All other documents, technical reports, legal descriptions, records and/or papers prepared by the design team for the project shall be sealed, signed and dated.

4.0 Document Review Requirements and Procedures

4.1 If needed, three in-progress reviews of the construction documents are required unless otherwise negotiated; one review at 30% completion, one review at 60% completion and a final review. The following items should be provided in all review documents:

4.1.1 **Compliance with applicable codes, standards and laws listed in the firm's contract, and outlined in Chapter 7.**

4.1.2 Coordination of structural, architectural, mechanical, plumbing, fire suppression and electrical designs and information.

4.1.3 Update of construction costs.

4.1.4 Update of project schedule.

5.0 30% Document Review Submittal

5.1 When the construction documents are 30% complete, the project architect/engineer shall follow the submittal and review procedures outlined above. The items listed below should also be included:

5.1.1 **Compliance with applicable codes, standards and laws listed in the firm's contract, and outlined in Chapter 7.**

5.1.2 Details showing construction of walls, doors and other components that are related to building code and accessibility standards.

5.1.3 Detail dimensions.

5.1.4 A roof plan showing roof slope, parapets, scuppers, roof drains as applicable to the project.

5.1.5 A structural plan for each level showing basic information as it relates to the structural components of the building.

5.1.6 Exterior elevations showing finish and existing grades.

5.1.7 Building sections, wall sections and critical details shall be identified.

5.1.8 Refinement of proposed building systems.

5.1.9 Preliminary finish schedule.

5.1.10 Provide outline specifications and material cut sheets to adequately describe equipment, materials and special requirements.

5.1.11 Edited specification sections appropriate to the project, including data on major materials, building systems and fire-resistive assemblies.

6.0 60% Document Review Submittal

6.1 When the construction documents are 60% complete, the project architect/engineer shall follow the submittal and review procedures outlined above. The items listed below should also be included:

6.1.1 **Compliance with applicable codes, standards and laws listed in the firm's contract, and outlined in Chapter 7.**

6.1.2 Refinement of the architectural drawings, including preliminary door, window and finish schedules.

6.1.3 Refinement of specifications, including information on installation of major materials, building components and building systems.

6.1.4 Budget review and analysis containing detailed material and labor takeoffs all elements of the project such as structural, architectural, mechanical, plumbing, fire protection and electrical, etc.

7.0 Final Document Review Submittal and Checklists

7.1 Plans and specifications shall be submitted for **final review** as follows:

7.1.1 **When the documents have been checked thoroughly by the project architect/engineer for compliance with all applicable building codes and accessibility laws , as outlined in Chapter 7.**

7.1.2 A compliance plan for fire and life safety, fire alarm and fire suppression systems for review and approval by DFM.

7.1.3 When the documents have been checked for completeness, accuracy, and coordination for all disciplines by the project architect/engineer in order to avoid any installation conflicts during construction.

7.1.4 Final review documents can be submitted on bond or blueline paper. DO NOT SEND FINAL REVIEW DOCUMENTS ON VELLUM.

7.1.5 A full and complete cost estimate to demonstrate the project is within the limits of the available funding.

7.2 The following checklists are designed to help the project architect/engineer submit a complete set of documents for the **final review** and should not be considered finite.

Drawing Sheets

- ☐ All drawing sheets, including the cover sheet, shall have a title block as described at the end of this chapter, including the project architect's/engineer's seal, signed and dated.
- ☐ A key plan, when necessary to identify areas of the floor plan when the plan is separated.

Cover Sheet

- ☐ Project title and project identification number ("A" number).
- ☐ Owner/state agency name.
- ☐ Building name and number.
- ☐ Project location.
- ☐ Division of Facilities Management street address, telephone number and fax number.
- ☐ Project architect/engineer's name, street address, telephone number, and fax number.
- ☐ Primary consultants' names and disciplines.
- ☐ Drawing sheet index.
- ☐ Vicinity and/or campus maps.

Site Plan(s)

- ☐ Site plan(s) shall be drawn to a scale not smaller than 1" = 50'-0" and each drawing's scale noted.
- ☐ Survey information.
- ☐ Clearly differentiate new features from existing.
- ☐ Sidewalks, including dimensions.
- ☐ Driveways including dimensions curb cuts, any painting and signage.
- ☐ Parking areas, including dimensions, curbs, striping, lighting standards, bollards, concrete bumpers and signage.
- ☐ Stairs and ramps including dimensions.
- ☐ Floor elevations shall be noted as both the actual elevation and the referenced elevation.
- ☐ Contours of existing and finish grades shall be shown at 1'-0" intervals, including spot elevations where needed.
- ☐ All horizontal control dimensions.
- ☐ Drainage.
- ☐ Landscaping.
- ☐ Final and existing grade elevations at all corners of the building and at such points as landings, walks and drives.
- ☐ Structures to be demolished.
- ☐ Construction limits and staging area.

- ☐ Contractor access and parking.
- ☐ Existing utilities to be removed or abandoned.
- ☐ Detailed utility site plans may be omitted if shown elsewhere on separate utility site plan and referenced accordingly.

ARCHITECTURAL

Floor Plans

- ☐ Where entire plan of the building or complex can not be shown on one sheet at 1/8" = 1'-0", a separate drawing shall be prepared to show the overall dimensions, arrangements and relationships of the various components of the project. A key plan shall appear with each of the working drawing plans to designate the section of the project to which each component relates.
- ☐ Complete dimensions to allow for constructability.
- ☐ Orientation, room titles and room numbers for all areas on each floor of the building.
- ☐ Key symbols for sections, door and window designations, elevations and details shall include section designations, sheet reference-
- ☐ Where floor elevations differ, the elevation of each shall be noted.
- ☐ Floor material transitions.
- ☐ Plan dimensions shall be to one face of masonry rather than to finish materials or center lines.
- ☐ Plan dimensions shall be to one side of wood framing members and to the centerline of metal framing members rather than to finish materials.
- ☐ Elements and components which must be coordinated among architectural, structural, mechanical and electrical plans shall be shown and referenced where they affect the work of the other trades.
- ☐ Large scale detail plans shall be shown at 1/4" =1'-0" for congested areas, toilet rooms and areas in which location of equipment is critical.
- ☐ Plumbing fixtures and dimension their location.
- ☐ Grid lines and column locations.

Architectural Schedules

- ☐ The door schedule shall indicate door size, type, frame type, hardware set number, detail references and its required fire rating.
- ☐ The window schedule shall include glass and frame type, sill height, required fire ratings, when applicable, and detail references
- ☐ The finish schedule shall include room names and numbers, floor, ceiling, wall and base materials and ceiling heights
- ☐ The partition type schedule shall be presented either graphically or in written format.
- ☐ Note: The door hardware schedules and toilet accessory schedules should appear in the specification manual.

Roof Plan

- ☐ Roof plan(s) shall be at an appropriate scale to present with clarity the following information but shall be shown a minimum scale of 1/8" = 1’ – 0”.
- ☐ Coordinate roof plan among all disciplines.
- ☐ Identify all materials such as cants, saddles and crickets, valleys, ridges and any change in elevations or slope.
- ☐ Locate and dimension roof and overflow drains.
- ☐ Locate gutters and downspouts.
- ☐ Note penetrations through the roof such as skylights, chimneys, ducts or vents, penthouses, mechanical equipment and roof curbs.
- ☐ Note changes of roof elevations.
- ☐ Note slopes or other significant conditions.

- ☐ Built-up roofs shall have a slope of not less than 1/4" per foot..
- ☐ Show insulation vents if required.
- ☐ Identify section and detail location(s).

Building Elevations

- ☐ Building elevations shall be drawn to the same scale as the plans.
- ☐ Elevation levels shall be noted including all portions below grade, areaways, tunnels, etc. (entire pier lengths need not be shown).
- ☐ Footings, foundations and other below grade items including brick and stone ledges shall be shown with a dashed line.
- ☐ Show grade elevations.
- ☐ Show vertical dimension of floors, ceilings, roof slabs.
- ☐ Identify all exterior wall materials.
- ☐ Locate doors, windows, control joints and expansion joints.
- ☐ Identify section marks
- ☐ Show all through roof penetrations and all light fixtures, louvers and other mechanical and electrical devices that appear on the exterior.
- ☐ Show all roof drains, scuppers, gutters and downspouts

Interior Elevations

- ☐ Show enlarged elevations of restrooms to indicate mounting heights of toilet fixtures and accessories, including items required for accessibility.
- ☐ Show interior elevations of kitchens and other areas where there is cabinetry, counters, shelving and casework, including items required for accessibility.
- ☐ Show material finishes and other special features that require additional detail.

Building Sections

- ☐ Building sections shall be drawn at the same scale as the building elevations.
- ☐ Show any special conditions
- ☐ Show interior room elevations and room identification
- ☐ Show stairs, corridors, chases, and plenum areas.
- ☐ Show floor, wall, ceiling and roof elevations
- ☐ Show major ductwork, piping, conduit and other equipment that intersects the space.

Wall Sections

- ☐ Wall sections shall be drawn at a scale of at least 3/4" = 1'-0". Wall sections are to show the building components in more detail and shall include including the following:
- ☐ Show typical and special wall construction
- ☐ Show dimensions and elevation levels from footings to roof
- ☐ Show in detail the wall thickness and connection detail to floor and roof systems & flashings
- ☐ Show the details at doors and windows and wall penetrations.
- ☐ Reference enlarged details

Details

- ☐ Details shall be drawn to scale of 3" = 1'-0".
- ☐ Show typical and special window heads, jambs, sills and mullions
- ☐ Show typical and special door heads, jambs, sills and transoms
- ☐ All exterior door details shall include sill details showing the threshold in relation to the floor and foundation wall.
- ☐ Show spandrel detail, parapets, cornices and overhangs

- ☐ Show special construction conditions and architectural features
- ☐ Show cabinets, shelves, racks, wardrobes, chalkboards and special equipment
- ☐ Show typical and special trim.
- ☐ Show stair risers, treads, landings, newels, handrails, guardrails and dimensions of all components.
- ☐ Show details of ramps including landings, handrails, guardrails, dimension all components and indicate in elevation the slope of the ramp as required by accessibility standards.
- ☐ Show all roof details necessary to install a weather tight roof.

Reflected Ceiling Plan

- ☐ Reflected ceiling plans shall be drawn at the same scale as the architectural floor plans.
- ☐ Show all typical and special ceiling materials and conditions:
- ☐ Show all ceiling materials, wall faces and profiles, exposed beams and other construction.
- ☐ Shall show all light fixtures, diffusers, grilles, access panels, speakers, sprinkler heads detectors, ceiling fans, and all other items affixed to the ceilings.
- ☐ Show skylights, drapery pockets and tracks, trim around columns, borders, trim cornices and control joints, coves, changes in ceiling height, bulkheads, soffits, structural supports, piers, columns
- ☐ Show desired ceiling pattern with proper dimensioning.

STRUCTURAL

- ☐ Drawings shall contain all dimensions and details necessary to layout and construct the building.
- ☐ Identify the building code used for design.
- ☐ Details shall identify all typical and special conditions that occur in all components of the structure.
- ☐ The foundation plans shall be drawn at the same scale as the architectural floor plans.
- ☐ Provide large-scale details, sections, schedules and notations to indicate the size, shape, materials, reinforcing and elevations of footings, piers, grade beams and walls and footing drain system.
- ☐ Foundation plans may be combined with slab on grade and basement plans if clarity is maintained.
- ☐ Framing plans shall be drawn at the same scale as the architectural plans.
- ☐ Schedules shall identify material, size, shape of member and identifying mark
- ☐ Note the design live loads used in the preparation of the structural members.
- ☐ Show column grid lines and verify that the locations match the architectural floor plans.
- ☐ Identify loading including, live load, dead load, and snow load.
- ☐ Identify species and grade of wood in wood construction.

ENGINEERING

Utilities Site Plan

- ☐ A utilities site plan shall be provided unless this data is included on the architectural site plan. Indicate surface features such as buildings, drives, parking, sidewalks, trees, etc.
- ☐ Show permanent and temporary utilities and include elevations for each.
- ☐ Coordinate utilities with the mechanical, electrical and plumbing plans.
- ☐ Indicate flow lines and invert information on manholes.
- ☐ Show all fire hydrant locations.

Plumbing Plans

- ☐ Plumbing plans shall be drawn to scale no smaller than the architectural plans.
- ☐ Show temporary piping.
- ☐ Show foundation drain line hook-ups.
- ☐ Show storm and sewer lines.
- ☐ Show complete water distribution system.
- ☐ Locate of all plumbing fixtures and equipment.
- ☐ Show sewage disposal system (if any).
- ☐ Show sewage and vent lines.
- ☐ Show gas supply and distribution (if any, and if not shown elsewhere).
- ☐ Show all necessary details, isometric diagrams, schedules and notes to describe fully and clearly all equipment, pipe and fitting types, sizes and materials.
- ☐ Show all pertinent floor elevations and slopes.
- ☐ Include plumbing riser diagrams and plans as required.
- ☐ Identify vents thru the roof and coordinate with the roof plan.
- ☐ Show roof drainage and overflow system.
- ☐ If there is no utilities site plan, the plans shall include a plumbing site plan to show the location, type, size and extent of exterior lines, connections and equipment.

Fire Suppression Plans

- ☐ Shall be drawn to the same scale as the architectural plans.
- ☐ The fire protection site plan shall show the location, type size and extent of exterior lines, connections and equipment, including locations of fire hydrants existing and new.
- ☐ Show hazard classification, room area and volume
- ☐ Show storage tanks.
- ☐ Show sprinkler heads, type, nominal orifice size and temperature rating.
- ☐ Show activation appliances.
- ☐ Show emergency abort button.
- ☐ Show interconnections with other building system (fire alarm, fan shutdown, etc.)
- ☐ Show occupancy/hazard class of each area or room, sprinkler design density, and design area of sprinkler coverage.
- ☐ Locate all partitions and identify all fire rated walls.
- ☐ Locate and size concealed spaces, closets, attics and bathrooms.
- ☐ Show enclosures in which no sprinklers are installed.
- ☐ Locate soffits or known ceiling obstructions.
- ☐ Show water supply with waterflow test information.
- ☐ Spacing of sprinklers and approximate head locations.
- ☐ Sprinkler piping, mains, size and location for coordination.
- ☐ Standpipe locations and hose connections
- ☐ Control valves and check valves, flow switches, water gongs, gauges, etc.
- ☐ Sprinkler test stations including provisions for test water removal.
- ☐ Fire pumps (if required) including size and flow requirements
- ☐ Indicate design calculation remote area.

Heating, Ventilating and Air Conditioning Plans

- ☐ Heating, ventilating and air conditioning plans shall be drawn to same scale as the architectural plans.
- ☐ HVAC plans shall be separate from the plumbing plans and electrical plans.
- ☐ Show partitions and room layouts, fire and smoke rated partitions including the rating
- ☐ Ductwork layout including size, pressure class (two line ductwork is required)
- ☐ Single line is acceptable for final run out to the diffuser or grille only.
- ☐ Provide layouts shall be accompanied by all necessary details, sections, schedules and notes to show the extent of the work and shall include the building heating and cooling loads (in BTU's/Hr), temperature differentials used and rated capacity of heating units.
- ☐ Locate fire and smoke dampers
- ☐ Show coil and tube pull areas.
- ☐ Indicate required code clearance areas.
- ☐ All devices such as balancing dampers, splitter dampers, volume extractors, balancing valves, thermometers, pressure gauges, instrument-flow fittings and instrument-access panels which are required for balancing shall be shown on the drawings.

Fire Alarm

- ☐ Provide a floor plan indicating the use of all rooms.
- ☐ Show locations of alarm-initiating and notification appliances.
- ☐ Show alarm control and trouble signaling equipment
- ☐ Show location of the annunciation panel.
- ☐ Show the power connection for the system.
- ☐ Provide battery calculations
- ☐ Show conductor type and sizes.
- ☐ Provide voltage drop calculations
- ☐ Provide manufacturers, model numbers and listing information for equipment, devices and materials.
- ☐ Show details of ceiling height and construction. Verify this information with the architectural plans.
- ☐ Show the interface of fire safety control functions.

Electrical Plans

- ☐ Electrical plans shall be drawn to the same scale as the architectural plans.
- ☐ Show all connections, permanent or temporary, inside and outside.
- ☐ Locations and sizes of all main-feeder and branch circuit conduits.
- ☐ Cables and wiring.
- ☐ Circuits noted by numbers.
- ☐ Names and capacities of special outlets.
- ☐ Locations and details of main and branch panels and other equipment.
- ☐ Locations, connections and controls of signals, speakers, clocks, telephones, fire alarms and other special systems.
- ☐ The electrical riser diagrams shall extend to and include all panel boards.
- ☐ The electrical distribution riser diagrams shall include all coordination and short circuit analysis data at each item.
- ☐ Indicate required code clearance areas of electrical equipment.
- ☐ The total building connected load and calculated load demand in kilowatts shall be scheduled as part of the riser diagram.
- ☐ The light fixture and similar electrical equipment schedules shall include the total watts consumed by each unit.
- ☐ The project architect/engineer shall coordinate all mechanical/electrical drawings to avoid installation conflicts during construction.

Final Specifications

- ☐ State that specific brands or catalog numbers listed in the specifications are intended only to establish performance, quality, type and physical characteristics.
- ☐ Whenever possible, a minimum of three manufacturers shall be listed as approved equal.
- ☐ Required performance criteria for all materials and assemblies should be included along with installation procedures (unless reference is made to follow manufacturers' procedures), coordination procedures and clean up methods.
- ☐ Balancing of all air-handling, hydronic and exhaust systems, when applicable, shall be prescribed in the mechanical specification in detail, including contractor requirements.
- ☐ **Procurement of testing services will be coordinated with the agency. Note when contractor should provide these services as part of their contract.**
- ☐ All devices such as balancing dampers, splitter dampers, volume extractors, balancing valves, thermometers, pressure gauges, instrument-flow fittings and instant access panels required for balancing shall be specified.
- ☐ The final specifications shall require a minimum of four complete sets of operations and maintenance manuals covering each item of equipment. These manuals shall be bound separately for the mechanical and electrical and any portion, which is under separate contract. The manuals shall include interconnection diagrams for mechanical and electrical equipment, complete schematic wiring diagrams of all electrical and electronic equipment or subsystems or components of mechanical or similar equipment which are adequate for troubleshooting or repair purposes.
- ☐ The final specifications shall require the contractor to provide a minimum of one complete run-through with operating agency of all new and modified equipment and systems. This allows the operating agency personnel to receive "hands-on" experience before the contractor leaves the project.

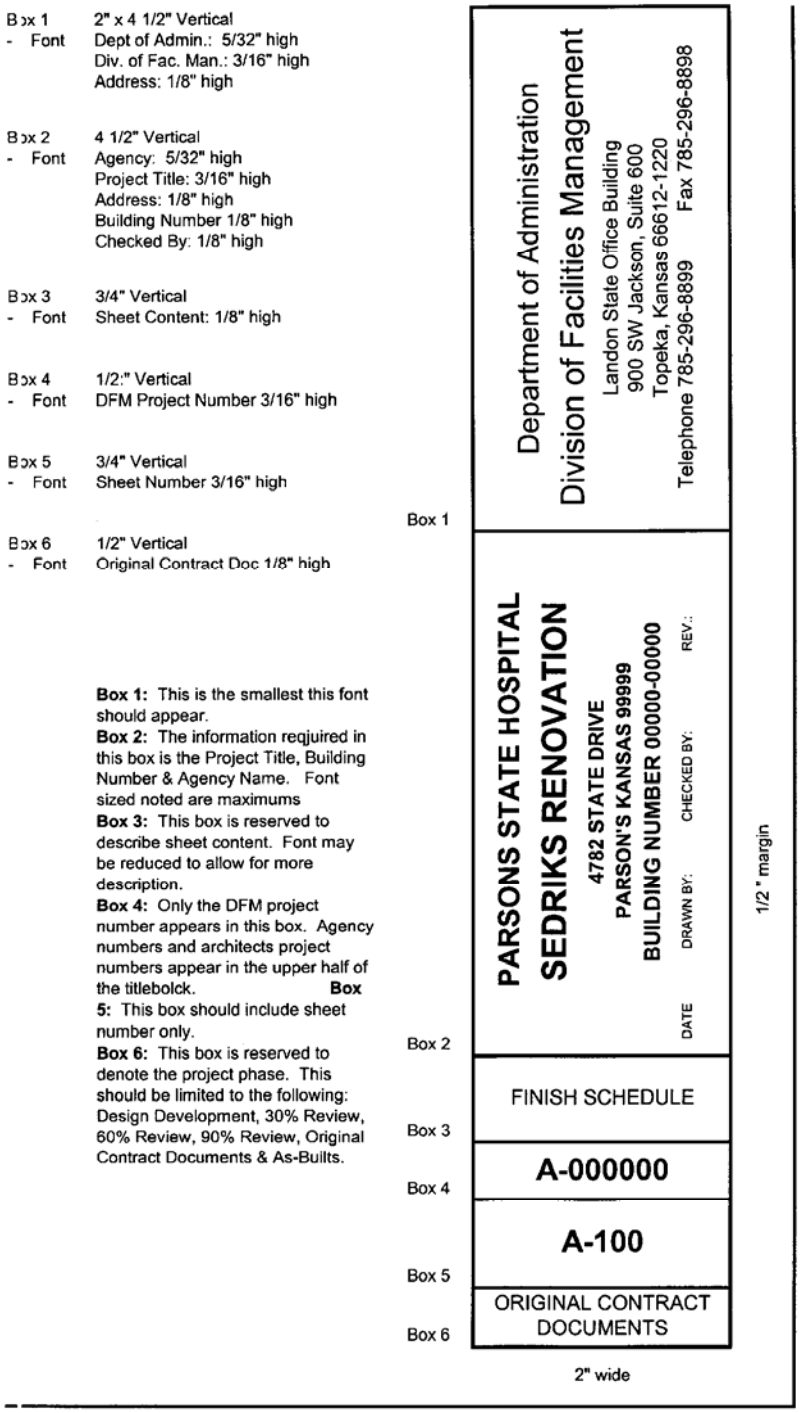
8.0 Submission of Final Tracings, Specifications and Electronic Files

8.1 The final bid drawings shall be submitted on velum or mylar along with a full set of the technical specifications on 8 1/2” x 11” bond to DFM for distribution when they have been corrected and checked thoroughly by the project architect/engineer for compliance with all applicable codes, standards and laws, completeness, accuracy, and coordination of all disciplines.

8.2 When the owner and DFM are satisfied that all requirements have been met, submission of the approved final tracings, specifications, and electronic files to the DFM planner by the project architect/engineer for release to bidders will complete the construction document phase of the project.

8.3 Approved final original tracings, specifications, and electronic files, shall become the **property of the State of Kansas** and be archived at DFM.

8.4 **Printing and distribution** of final plans and specifications and addenda will be coordinated by DFM and costs will be paid from the project funds. If a project is rebid or reissued due to errors and omissions by the project architect/engineer and/or the firm’s consultants, the project architect/engineer may be required to pay for the printing and shipping costs associated with the re-issuance of the construction documents.



END OF CHAPTER 13